RoyalTek

BT GPS mini (RBT-1000) User Manual V.1.5

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1. Product Introduction

1.1. Overview

BT GPS mini (RBT-1000)-A compact combo-device with Bluetooth and GPS technology

1.1.1. Wireless GPS receiver:

BT GPS mini, a multi-wireless GPS consumer product, is the smallest and most cost-effective Bluetooth GPS receiver in the world. It has a built-in replaceable and rechargeable Lithium-ion battery just using the same battery of Nokia 6100 cell phone. With the dimension of 70(L) x 41(W) x 23(H) mm and weight only 60g, making it an ideal solution to carry everywhere.

BT GPS mini is both precise and durable. Its 12-channel receiver allows for continuous tracking of all visible satellites. By wearing this Bluetooth GPS around your neck and having your bluetooth integrated with any kind of mobile device, such as PDA or Notebook, it will provide your exact location almost anywhere.

1.2. Main Features

- Twelve parallel channels
- Support 2D / 3D information
- Hot/ Warm/ Cold start time: 8/ 38/ 45 seconds
- RF MCX connector for external GPS antenna
- Support standard NMEA-0183 at 57600 bps baud rate
- Compatible with Bluetoth devices with SPP (Serial Port Profile)
- Three LEDs showing Bluetooth, GPS and battery status
- Rechargeable and replaceable Lithium-ion battery, also compatible with Nokia 6100 cell
- Power switch

1.3. Product Notification

- Operating temperature range -20 ºC to +60 ºC
- Charger operating temperature range 0 ºC to +40 ºC
- Battery Storage temperature range -20 ºC to +50 ºC
- Lithium-ion battery lasts more than 8 hours in continuous operation mode.
- Humidity range up to 95% no condensing

1.4. Application

- Navigation
- Automotive Vehicle Tracking
- Personal Positioning
- Geographic Surveying
- Sporting and Recreation
- Consumer wireless GPS
- Cellular Phone

2. Quick Start

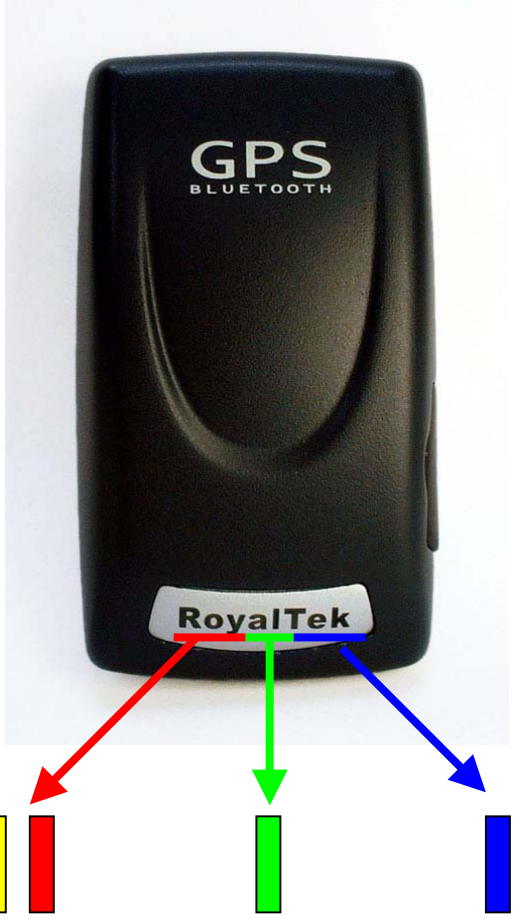
2.1. Control Switch, Power Jack & Antenna Port

Power Switch

Power Jack

External Antenna Port

2.2. LED Display



- Blinking Blue light indicates Bluetooth in connection

- Green light grows indicates power on
- Blinking Green light indicates GPS position fixed

- Yellow light indicates charging

- Blinking red light indicates low power

2.3. Hardware Features

2.3.1. Power Switch

Power ON / Power OFF

2.3.2. Power Jack

The power jack allows you to connect to either a DC (included) or AC power charger to recharge the internal battery.

2.3.3. External Antenna Port

If you have an external antenna with a male MC Card connector (available separately), you can use it instead of the **BT GPS mini** receiver's internal antenna. Simply plug your external antenna into the antenna port.

2.3.4. Bluetooth Status LED (Blue)

Flashing - Bluetooth is on and ready to transmit.

2.3.5. GPS Status LED (Green)

Flashing - Position is fixed.

Steady light – Device is on but position is not fixed.

2.3.6. Battery Status LED (Red/Yellow)

None - Battery has adequate power supply.

Red - Power is low. Charging immediately is required.

Yellow - Connected to power charger, charging.

LED off - Battery is fully charged.

2.4. Getting Started

2.4.1. STEP 1: Charge the Battery

1. Before you use the Bluetooth GPS Receiver, the battery must be charged. Connect the power charger to the power jack, and then plug into an electrical outlet. As the device is charging, the Battery Status LED will show a yellow light.
2. When the battery is fully charged, the Battery Status LED will turn off. Unplug the device and remove the charger.

2.4.2. STEP 2: Turn on Receiver and Wait for GPS Fix

1. The GPS Status LED will initially show a steady green light to show that the position has not been fixed yet.
2. After the position is fixed, the GPS Status LED will be showing flashing green. Now you are ready to connect to your Bluetooth-enabled mobile device and use your GPS application.

2.4.3. STEP 3: Connect to Bluetooth-Enabled Devices

1. From your Bluetooth-enabled mobile device, perform a Bluetooth device discovery. Refer to the user documentation for your Bluetooth-enabled device for instructions.
2. After connection is created between Bluetooth-enabled device and Bluetooth GPS, the LED will show flashing blue light.

Note: If it is needed to type in Pin code during configuration, please Key in " 0000".

2.4.4. STEP 4: Use GPS Application

1. Load your GPS mapping or routing software, along with the corresponding maps of the areas that you are occupying or plan to travel to.
2. Start the application. Make sure the application is set for the COM port that your Bluetooth-enabled mobile device will use for serial communication. Now you should be ready to use your GPS application as directed by the user documentation that came with the software. More configurations may be necessary.
3. Refer to the following software application user manual to set up the parameters of the device via Bluetooth radio.

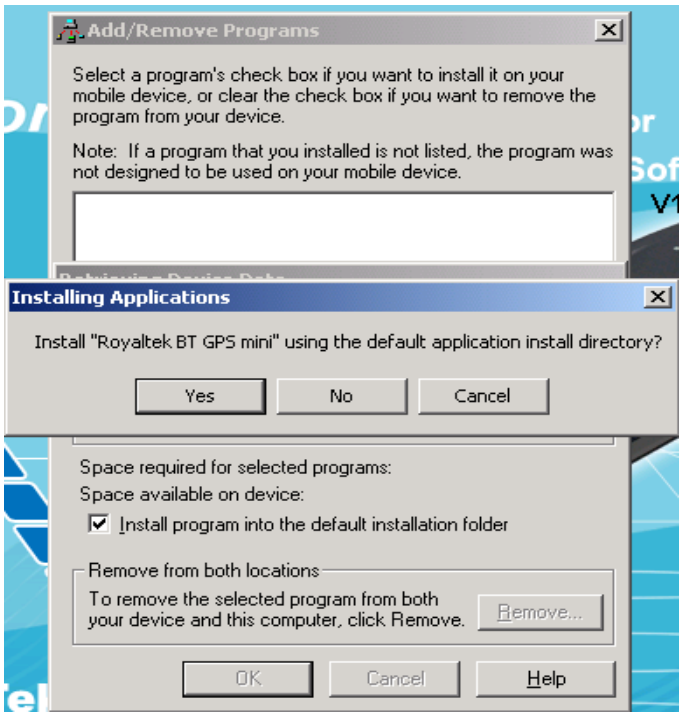
3. Installation

The Main Menu of Installation CD shows as above.

- Click the **Software for Windows 2000/XP; Software for Windows 98SE/ME** to install the PC software application.
- Click the **Software for Pocket PC 2002; Software for Pocket PC 2003** to install the PDA software application.
- Click the **Software for Palm OS** to install Palm software application.
- Click the **User Manual** to open the user manual of Bluetooth GPS.
- Click the **View Our Website** to link our http://www.RoyalTek.com, please make sure your PC connects to Internet first.
- Click the **Browse CD Contents** to open the explorer to browse the files within the CD.

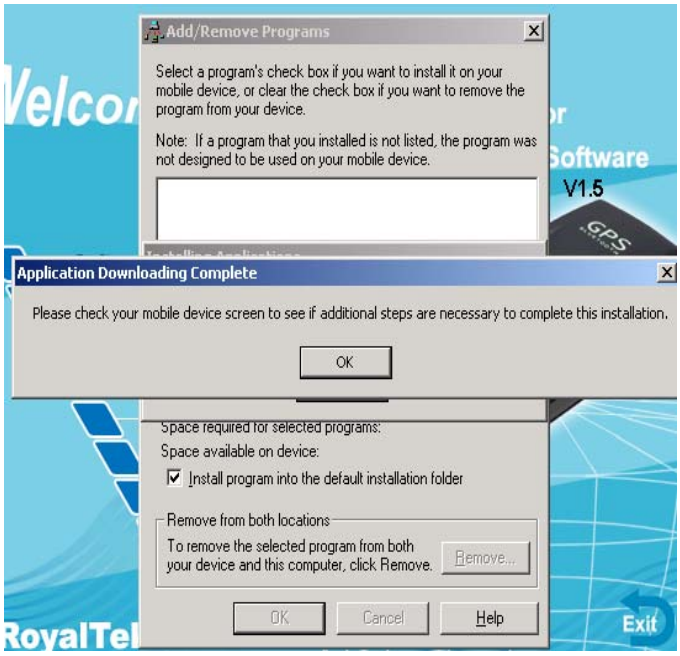
3.1. Install PDA Software Application

Before you click the **"Software for Pocket PC 2002; Software for Pocket PC 2003"** to install the PDA software application from CD, you have to synchronize the PDA and your system. Then the following window will show in your system as below:

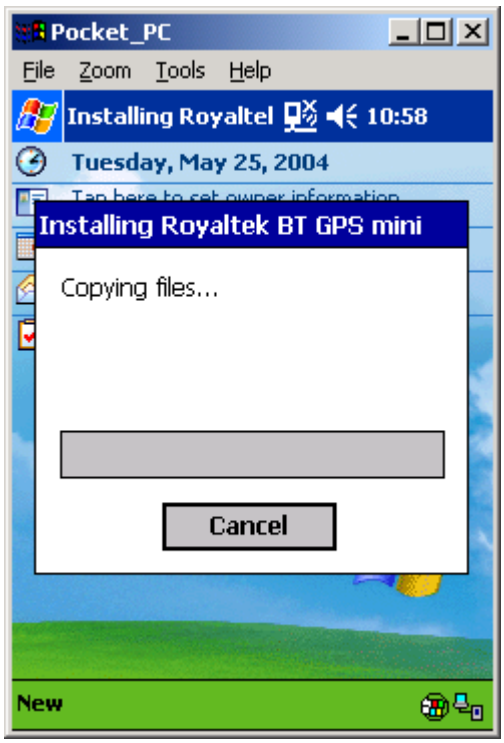

Add/Remove Programs
Select a program's check box if you want to install it on your mobile device, or clear the check box if you want to remove the program from your device.
Note: If a program that you installed is not listed, the program was not designed to be used on your mobile device.
Installing Applications
Install "Royaltek BT GPS mini" using the default application install directory?
Yes
No
Cancel
Space required for selected programs:
Space available on device:
Install program into the default installation folder
Remove from both locations
To remove the selected program from both your device and this computer, click Remove.
Remove...
OK
Cancel
Help

Click "Yes>" to continue. Or click "No" to select the other destination to install, or "Cancel" to give up installation.

Click " OK" to complete the installation.


Add/Remove Programs
Select a program's check box if you want to install it on your mobile device, or clear the check box if you want to remove the program from your device.
Note: If a program that you installed is not listed, the program was not designed to be used on your mobile device.
Application Downloading Complete
Please check your mobile device screen to see if additional steps are necessary to complete this installation.
OK
Space required for selected programs:
Space available on device:
Install program into the default installation folder
Remove from both locations
To remove the selected program from both your device and this computer, click Remove.
Remove...
OK
Cancel
Help
Software
V1.5
Exit

You can also see the “Installing RoyakTek **BT GPS mini** ” message box.

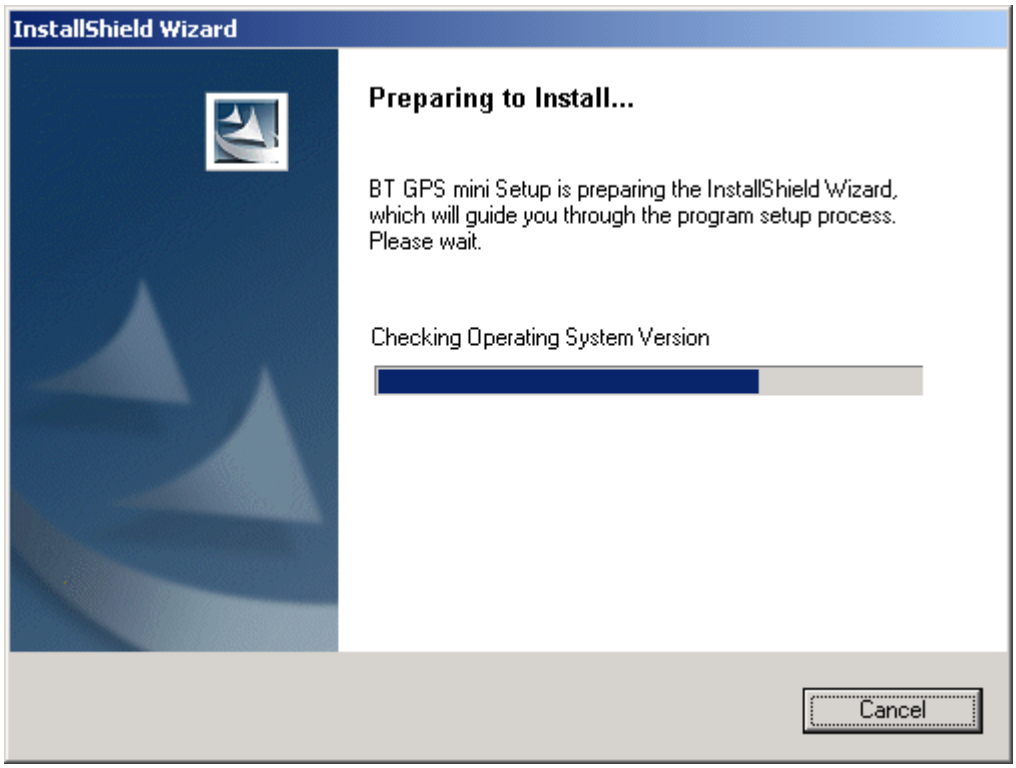


Note: About to install the software application to your PDA, please refer to your user manual of your PDA manufacture.

3.2. Install PC Software Application

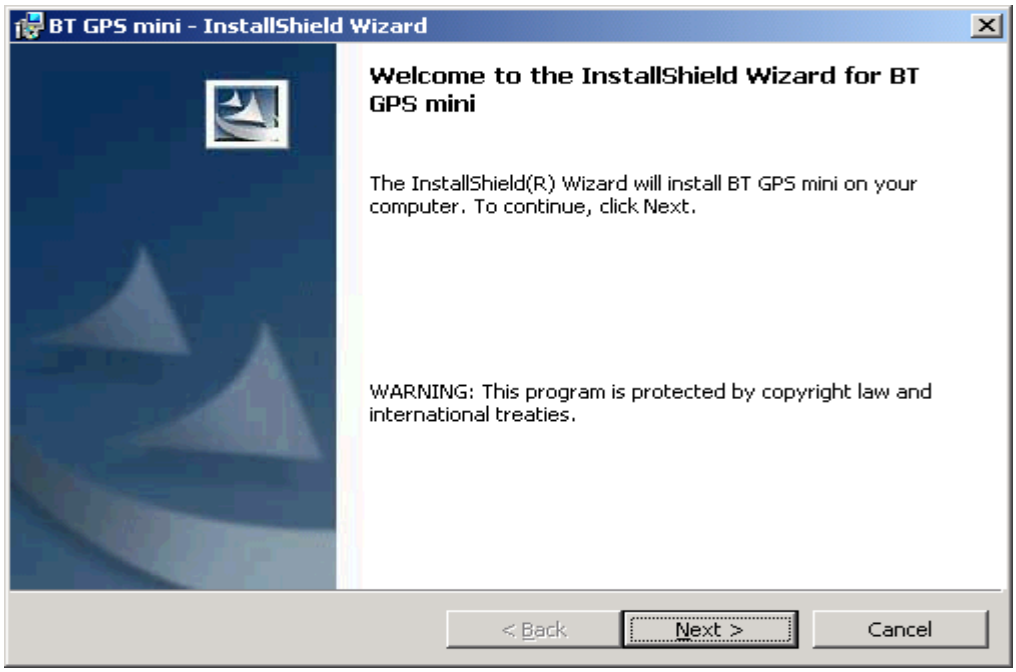
Install the pc software application from CD.

When screen shows the installation window as follows:


InstallShield Wizard
Preparing to Install...
BT GPS mini Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.
Checking Operating System Version
Cancel

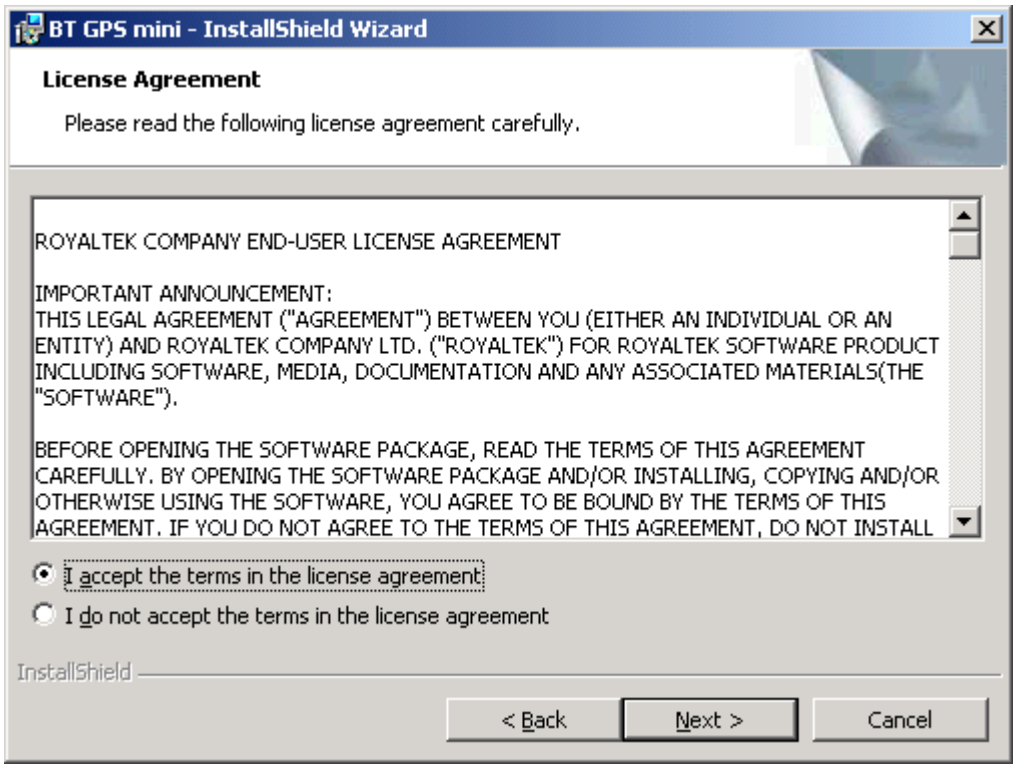
Click “Cancel” to give up installation.

Then you will get into the Bluetooth GPS welcome page

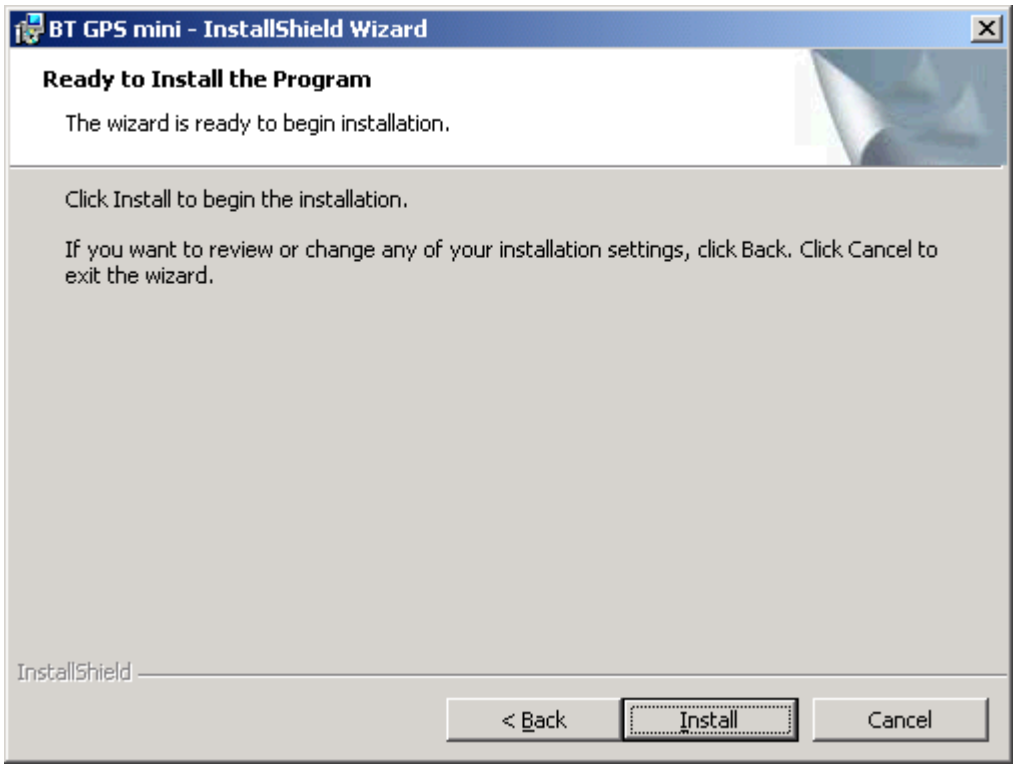

BT GPS mini - InstallShield Wizard
Welcome to the InstallShield Wizard for BT GPS mini
The InstallShield(R) Wizard will install BT GPS mini on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

Click “Next> to next page” , or click”<Back” to back last stage or “Cancel” to give up installation.

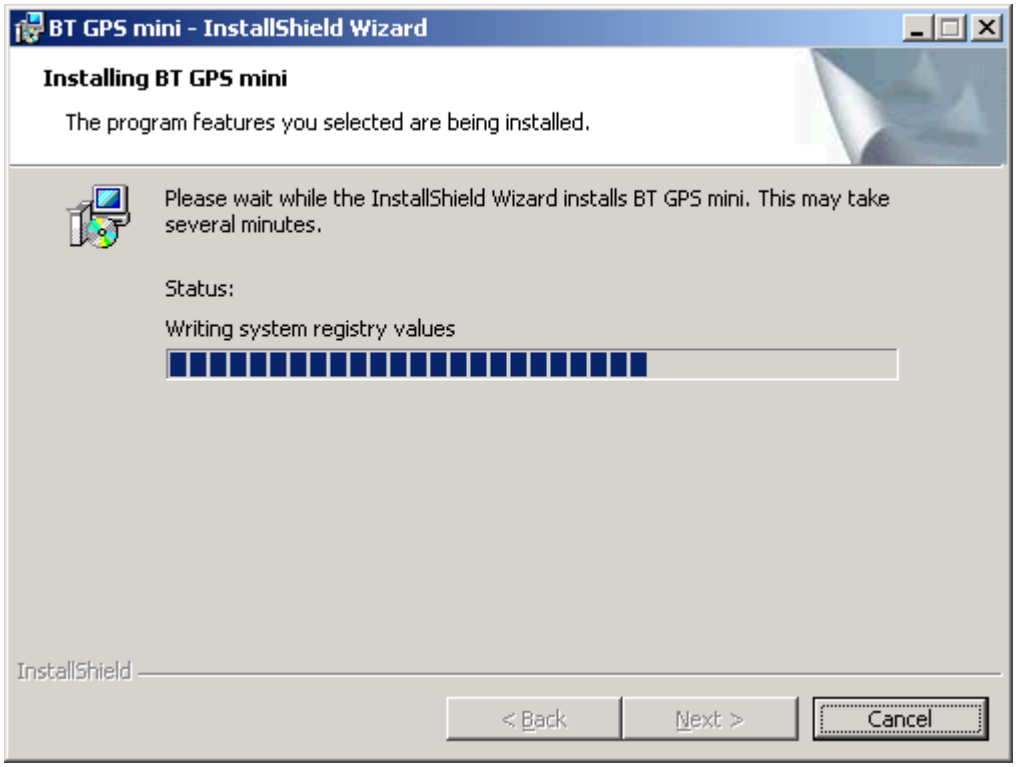
To the License Agreement page:


BT GPS mini - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
ROYALTEK COMPANY END-USER LICENSE AGREEMENT
IMPORTANT ANNOUNCEMENT:
THIS LEGAL AGREEMENT ("AGREEMENT") BETWEEN YOU (EITHER AN INDIVIDUAL OR AN ENTITY) AND ROYALTEK COMPANY LTD. ("ROYALTEK") FOR ROYALTEK SOFTWARE PRODUCT INCLUDING SOFTWARE, MEDIA, DOCUMENTATION AND ANY ASSOCIATED MATERIALS(THE "SOFTWARE").
BEFORE OPENING THE SOFTWARE PACKAGE, READ THE TERMS OF THIS AGREEMENT CAREFULLY. BY OPENING THE SOFTWARE PACKAGE AND/OR INSTALLING, COPYING AND/OR OTHERWISE USING THE SOFTWARE, YOU AGREE TO BE BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, DO NOT INSTALL
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel

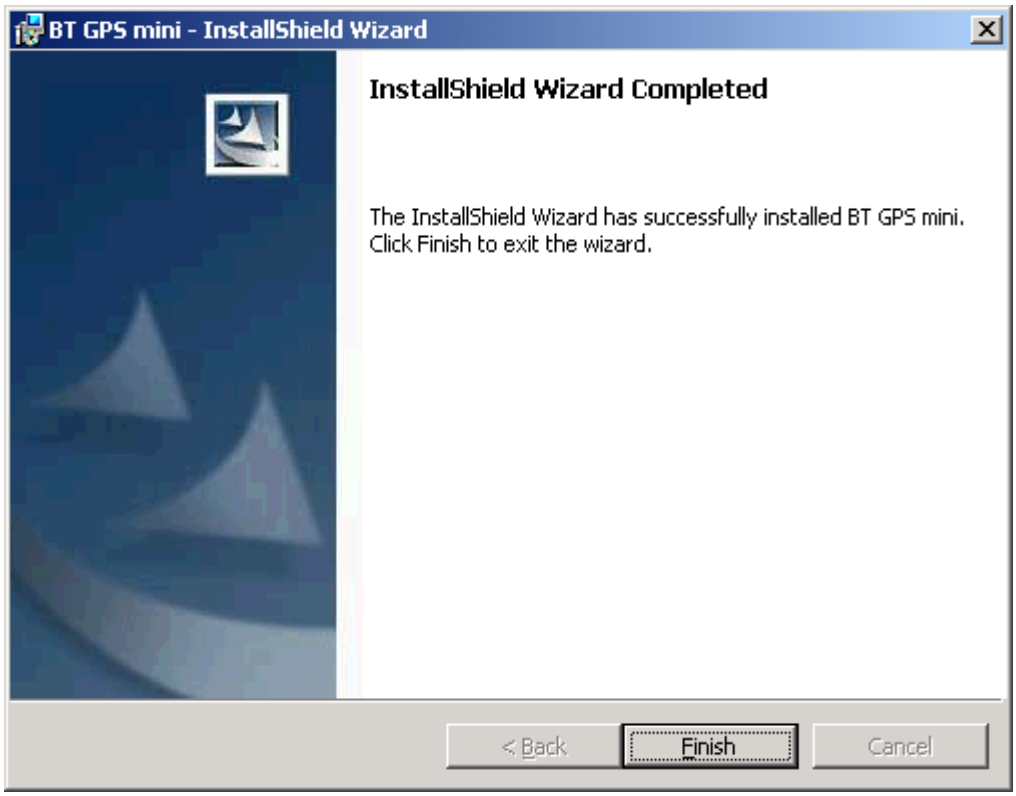
Click " I accept the terms of the license agreement" then click "Next>" to next page, or click"<Back" to back last stage or "Cancel" to give up installation.


BT GPS mini - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

Click "Install" to start installation. Or click"<Back" to back last stage or "Cancel" to give up installation.


BT GPS mini - InstallShield Wizard
Installing BT GPS mini
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs BT GPS mini. This may take several minutes.
Status:
Writing system registry values
InstallShield
< Back
Next >
Cancel

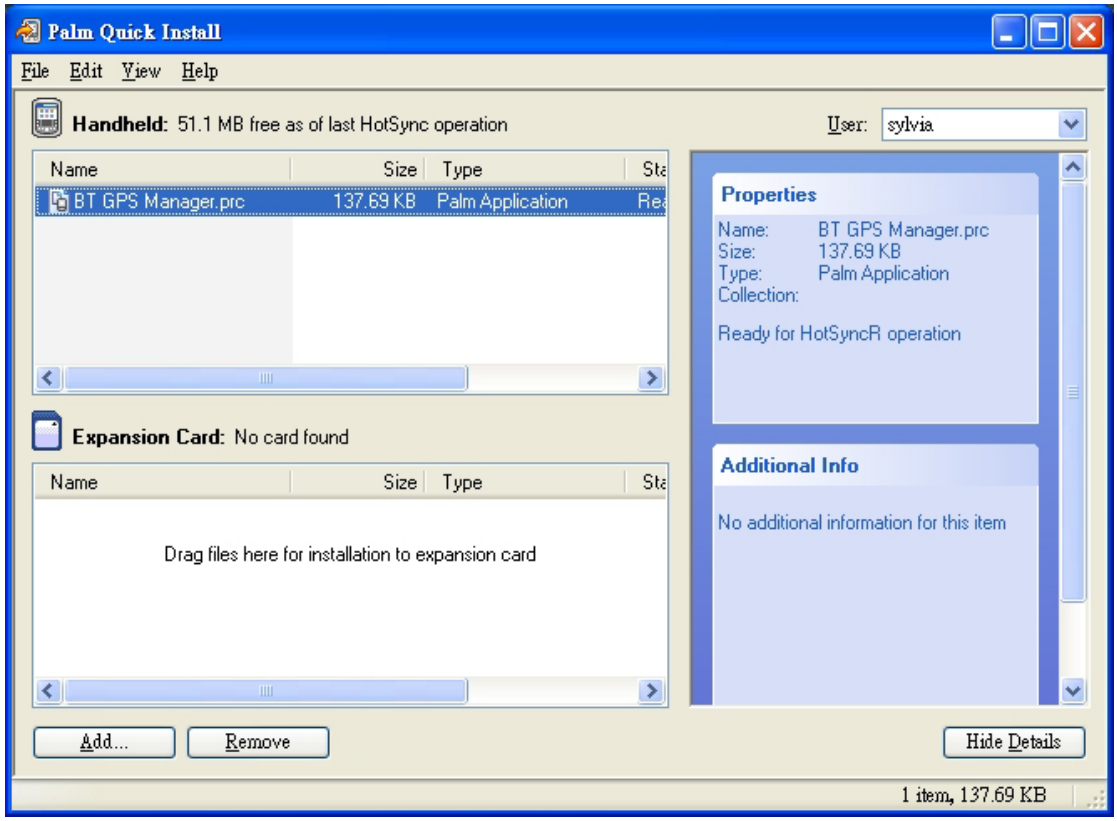
Then start installation. And finish installation will ask you to restart your computer as follow window.


BT GPS mini - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed BT GPS mini. Click Finish to exit the wizard.
< Back
Finish
Cancel

Please click “Finish” to finish the Installation. And your desktop will appear the Bluetooth GPS icon. Or click”<Back” to back last stage or “Cancel” to give up installation.

You can double click the Bluetooth GPS icon to execute the Bluetooth GPS software application.

3.3 Install Palm Software Application



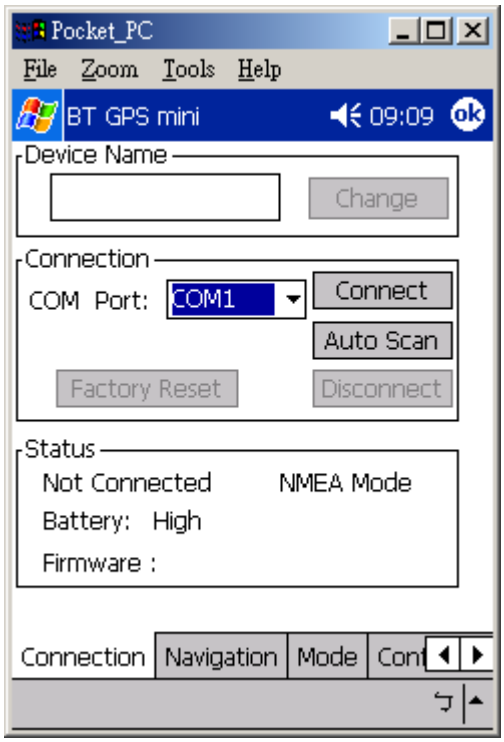
Note:

To execute this Palm Software Application, please install Palm software in advance.

4. Software Application User Manual for PDA

4.1. Connection Page

User has to set up a connection with BT GPS mini device by this dialog.



4.1.1. Device Name

When connection is successful, it will show the Device's ID Name automatically.

4.1.2. Change

When connection is successful, the "Change" Button will be workable. If you want to change the Device's Name, please enter the new Device's ID Name in the BT GPS mini ID field, then click "Change" button to upload the Device's ID Name to BT GPS mini .

4.1.3. COM Port

Indicate Bluetooth serial com port.

4.1.4. Connect

Connect to the BT GPS mini device. When you try to connect to Bluetooth enabled device, the window will pop up a “Connection” dialogue box with “Waiting” message.

And it means connecting successful when seeing a “BT GPS mini” dialogue box with “Set up connection with device” message.

If the window is shown a “BT GPS mini” dialogue box with “Failed to set up connection” message. It means the connection failed, please try it again.

4.1.5. Auto Scan

Automatically scan the **BT GPS mini** COM port in order to connect to **BT GPS mini** device.

4.1.6.Factory Reset:

Factory reset to the device. To reset all parameters and to disconnect Bluetooth.

4.1.7. Disconnect

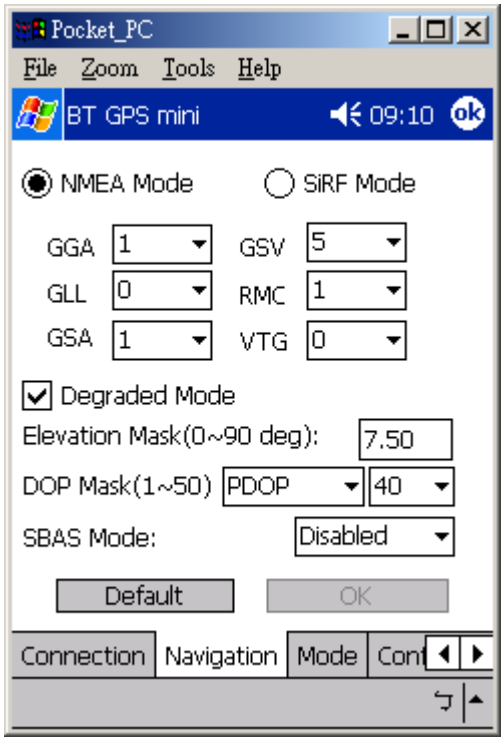
Disconnect to the BT GPS mini device.

Note:

When performing the Auto Scan, the user has to wait for a while because it will need time to get necessary system information from **BT GPS mini**.

4.2. Navigation Page

You can set GPS-relative parameters by this dialog.



4.2.1. NMEA Mode / SiRF Mode

Display (or change) the mode of device.

Setup the parameters of in NMEA Mode or SiRF Mode.

4.2.2. Degraded Mode

Enable or disable degraded mode.

4.2.3. Elevation mask

Elevation mask setting.

4.2.4. DOP Mask

DOP mask type and DOP mask value setting.

4.2.5. SBAS Mode

Enable or disable SBAS function.

4.2.6. Default

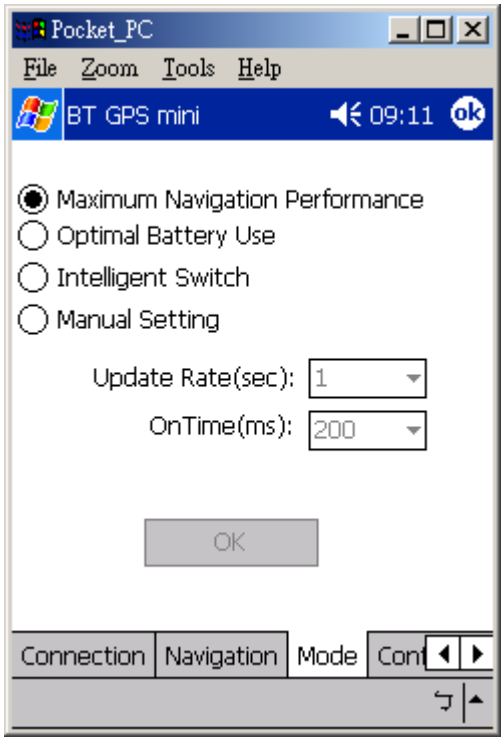
Reset values of this dialog into default value. It has not changed the setting of device yet. You still need to push OK button if you want to change the setting of device.

4.2.7. OK

Upload the parameters to the **BT GPS mini**.

4.3. Mode:

Use this page for power mode setting.



4.3.1. Maximum Navigation Performance:

Select for best system performance.

4.3.2. Optimal Battery Use:

Select to optimize the battery usage.

4.3.3. Intelligent Switch:

Select for switching power mode automatically.

When position keeps still, it enters power save mode. When position is in high speed updating, it enters max performance mode.

4.3.4. Manual Setting:

Select for adjusting the Update Rate and On Time value.

(Suggestion: Optimized for the device by selecting Maximum Navigation Performance or Optimal Battery Use for default value setting.)

4.4. Configuration

Use this page to set the system configuration values.

4.4.1. Change Password

Display the “ Change Password” dialog screen.

4.5. About

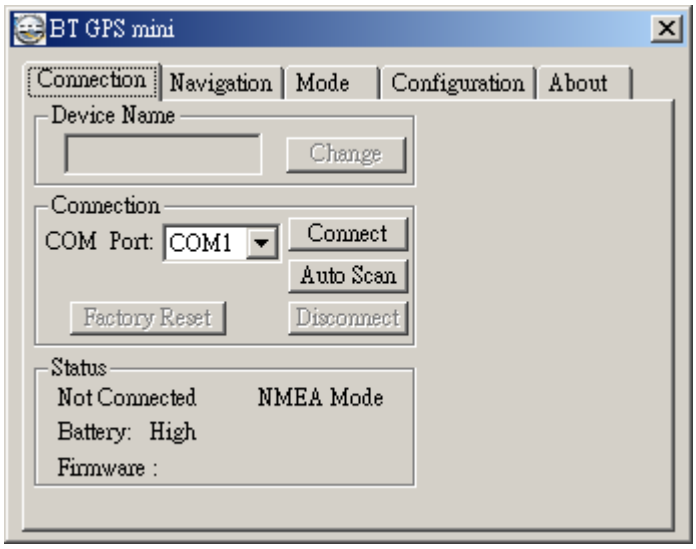
This page shows the software version and the copyright claim.

Pocket_PC
File Zoom Tools Help
BT GPS mini 07:30 ok
BT GPS mini : 1.5.5.115
Build Date: May 27 2004
Copyright 2003-2004 RoyalTek Company Ltd. All rights reserved.
Mode
Configuration
About

5. Software Application User Manual for PC

5.1. Application User Interface

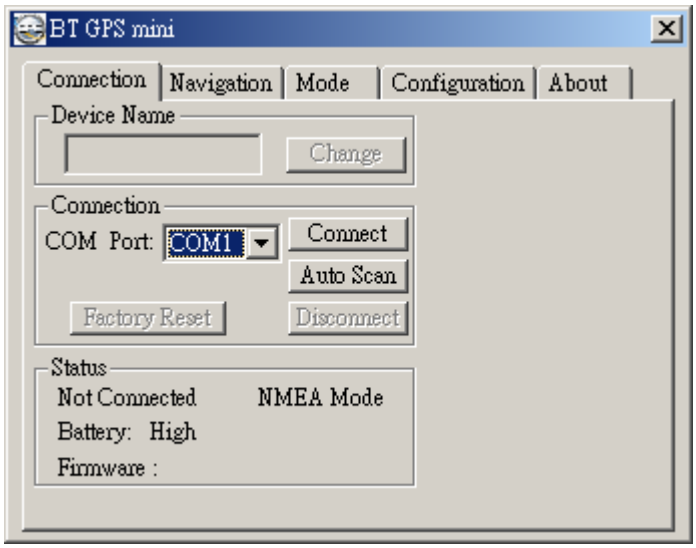
Click the icon as right in your desktop to run the software after install the **BT GPS mini** software. Then you can see the **BT GPS mini** window as Figure 1.



You can choose the button in the left side to open the dialogs for each function setting such as Connection, Navigation, Mode, Configuration, About. And use the left up buttons to minimize or close the window.

5.2. Connection Page

User has to set up a connection with **BT GPS mini** device by this dialog.



5.2.1. Device Name

When connection is successful, it will show the Device's ID Name automatically.

5.2.2. Change

When connection is successful, the "Change" Button will be workable. If you want to change the Device's Name, please enter the new Device's ID Name in the **BT GPS mini** ID field, then click "Change" button to upload the Device's ID Name to **BT GPS mini**.

5.2.3. COM Port

Set up the **BT GPS mini** COM Port.

5.2.4. Connect

Connect to the **BT GPS mini** device. When you try to connect to Bluetooth enabled device, the window will pop up a "Connection" dialogue box with "Waiting" message.

And it means connecting successful when seeing a "**BT GPS mini**" dialogue box with "Set up connection with device" message.

If the window is shown a "**BT GPS mini**" dialogue box with "Failed to set up connection" message, it means the connection failed, please try again.

5.2.5. Auto Scan

Automatically scans the **BT GPS mini** COM Port and baud rate in order to connect **BT GPS mini** device.

5.2.6. Factory Reset:

Factory reset to the device. To reset all parameters and to disconnect Bluetooth.

5.2.7. Disconnect

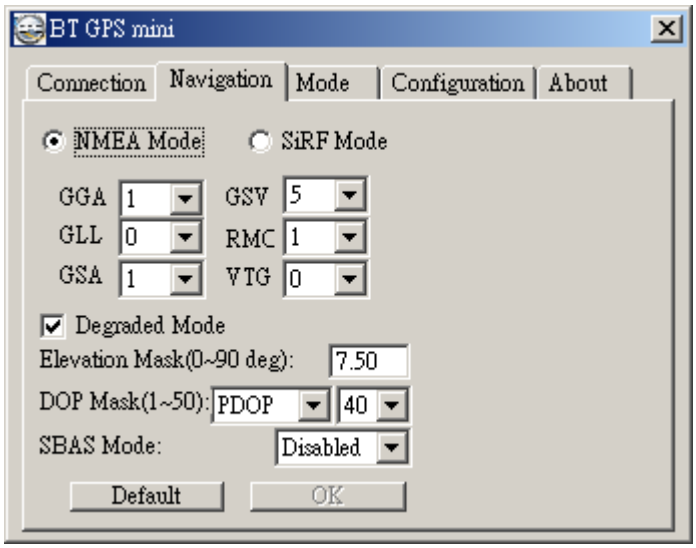
Disconnect to the **BT GPS mini** device.

Note:

When perform Auto Scan, user has to wait for a while because it will take time to get necessary system information from **BT GPS mini**.

5.3. Navigation Page

You can set GPS-relative parameters by this dialog.



5.3.1. NMEA Mode / SiRF Mode

Display (or change) the mode of device.

Setup the parameters of NMEA Mode or SiRF Mode.

5.3.2. Degraded Mode

Enable or disable degraded mode.

5.3.3. Elevation mask

To set the parameter of the Elevation mask.

5.3.4. DOP Mask

DOP mask type and DOP mask value setting.

5.3.5. SBAS Mode

Enable or disable SBAS function.

5.3.6. Default

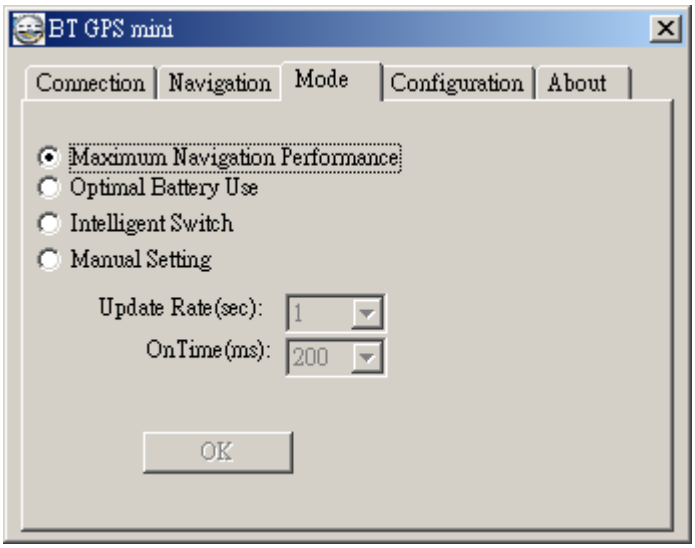
Reset values of this dialog into default value. It has not changed the setting of device yet. You still need to push OK button if you want to change the setting of device.

5.3.7. OK

Upload the parameters to the **BT GPS mini**.

5.4. Mode

Use this page for power mode setting.



5.4.1. Maximum Navigation Performance:

Select for best system performance.

5.4.2. Optimal Battery Use:

Select to optimize the battery usage.

5.4.3. Intelligent Switch

Select to switch power mode automatically.

When position keeps still, it enters power save mode. When position is in high speed updating, it enters max performance mode.

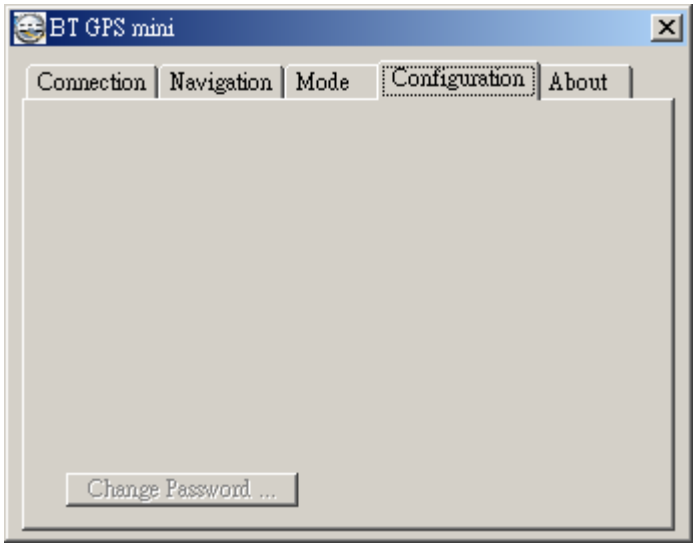
5.4.4. Manual Setting:

Select for adjusting the Update Rate and On Time value.

(Suggestion: Optimized for the device by selecting Maximum navigation Performance or Optimal Battery Use for default value setting.)

5.5. Configuration:

Use this page to set the system configuration values.

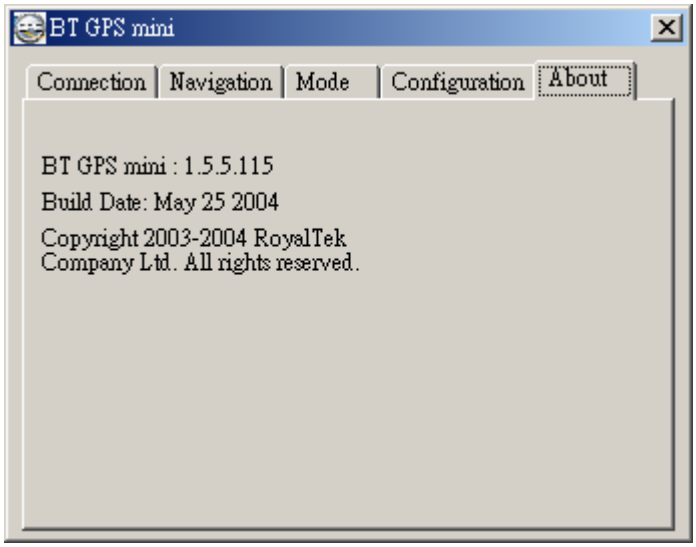


5.5.1. Change Password

Display the “ Change Password” dialog screen.

5.6. About

This page shows the software version and the copyright claim.



6. Palm Software Application User Manual

6.1. Connection Page

User has to set up a connection with **BT GPS mini** device by this dialog.

6.1.1. Device Name:

When connection is successful, it will show the Device's ID Name automatically.

6.1.2. Change:

When connection is successful, the "Change" Button will be workable. If you want to change the Device's Name, please enter the new Device's ID Name in the **BT GPS mini** ID field, then click "Change" button to upload the Device's ID Name to **BT GPS mini**.

6.1.3. COM Port:

Indicate Bluetooth serial com port.

6.1.4. Connect:

Set up the connection with **BT GPS mini** device. it again.

6.1.5. Factory Reset:

Factory reset to the device. To reset all parameters and to disconnect Bluetooth.

6.1.6. Disconnect:

Disconnect to the **BT GPS mini** device.

Note:

When performing the Auto Scan, the user has to wait for a while because it will get necessary system information from **BT GPS mini**.

6.2. Navigation Page

You can set GPS-relative parameters by this dialog.

6.2.1. NMEA Mode / SiRF Mode:

Display (or change) the mode of device.

Setup the parameters of in NMEA Mode or SiRF Mode.

6.2.2. Degraded Mode:

Enable or disable degraded mode.

6.2.3. Elevation mask:

Elevation mask setting.

6.2.4. DOP Mask:

DOP mask type and DOP mask value setting.

6.2.5. SBAS Mode:

Enable or disable SBAS function.

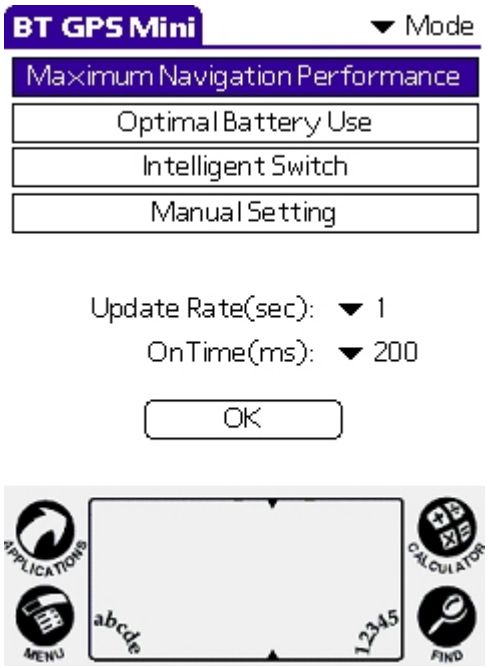
6.2.6. Default:

Reset values of this dialog into default value. It has not changed the setting of device yet. You still need to push OK button if you want to change the setting of device.

6.2.7. OK:

Upload the parameters to the **BT GPS mini**.

6.3. Mode:



Use this page for power mode setting.

6.3.1. Maximum Navigation Performance:

Select for best system performance.

6.3.2. Optimal Battery Use:

Select to optimize the battery usage.

6.3.3. Intelligent Switch:

Select for power mode automatically switch.

When position keeps still, it enters power save mode. When position is in high speed updating, it enters max performance mode.

6.3.4. Manual Setting:

Select for adjusting the Update Rate and On Time value.

(Suggestion: Optimized for the device by selecting Maximum Navigation Performance or Optimal Battery Use for default value setting.)

6.4. Configuration:

Use this page to set the system configuration values.

6.4.1. Change Password:

Display the “Change Password” dialog.

6.5. About:

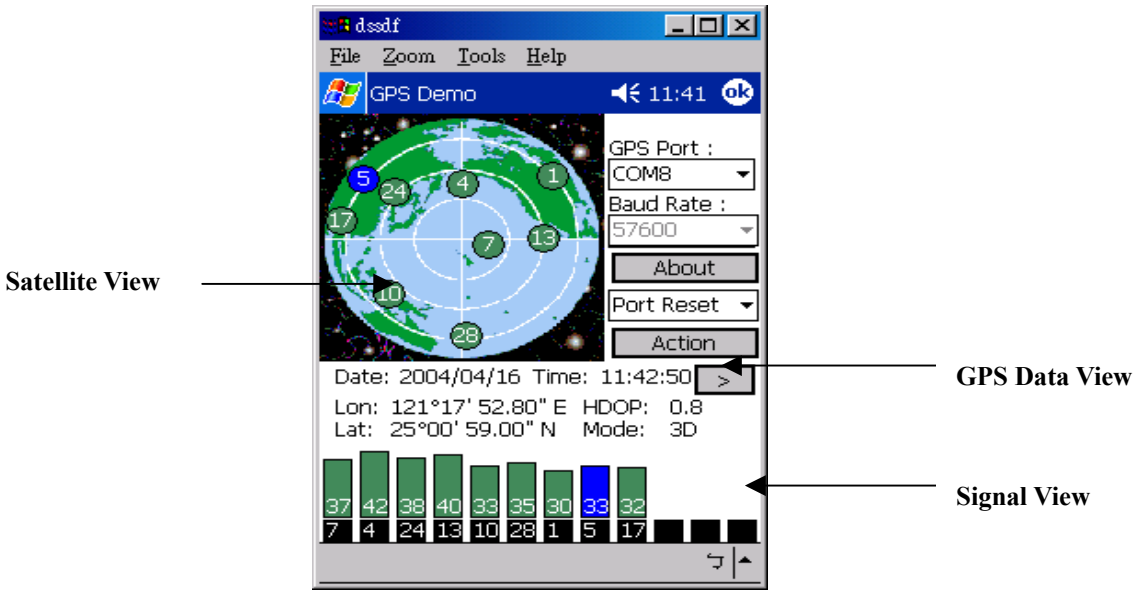
This page shows the software version and the copyright claim.

7. GPS Test on PDA

7.1. Execute GPS Demo Program

Execute RoyalTek GPS Demo program by double clicking **RoyalTek GPS Demo** icon on **Programs** menu.

7.2. GPS Demo Screen



7.2.1. GPS Port:

GPS port searching automatically by GPS port first or using COM1 as the default com port.

7.2.2. Baud Rate:

Sole baud rate : 57600.

7.2.3. About:

Version displays..

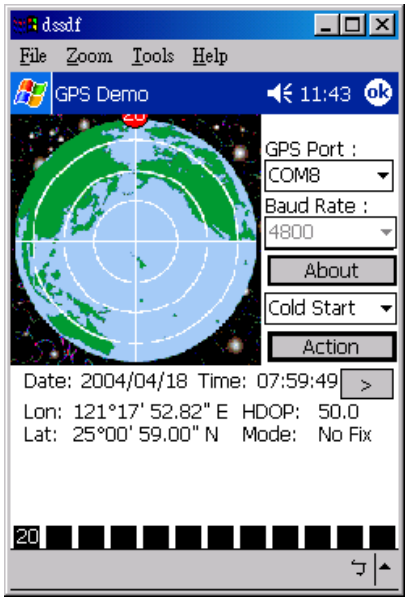
7.2.4. Action:

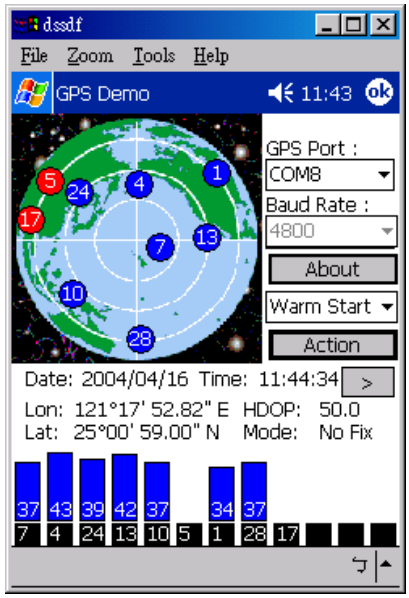
GPS action selection.

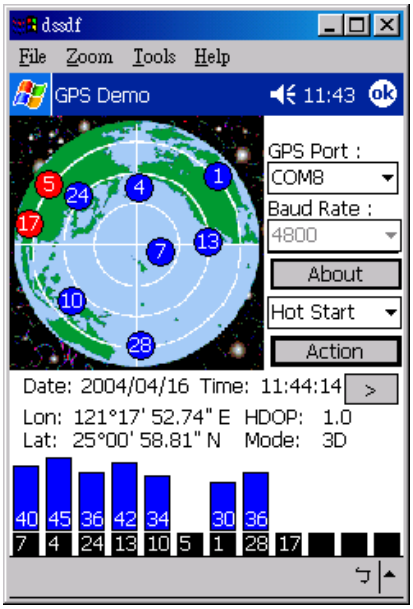
7.2.5.

Switch to next screen shot.

7.3. Cold/Warm/Hot Start







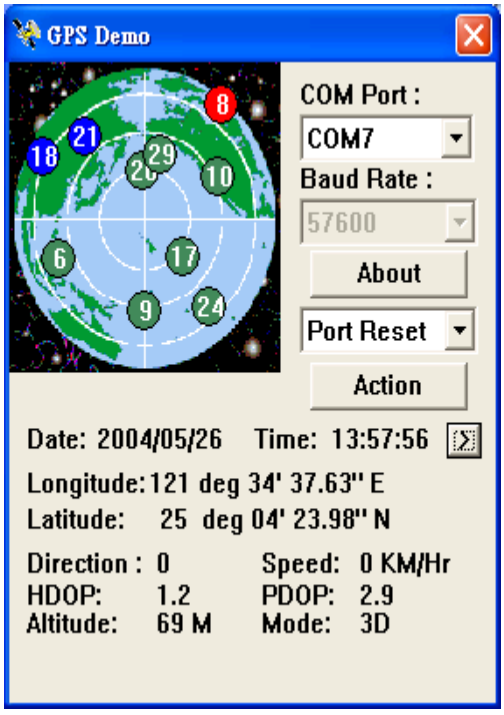
Selecting Cold/Warm/Hot Start in function scroll bar, then click **Action** to initialize Cold/Warm/Hot Start function.

7.4. About

This page shows the software version and the copyright claim.

7.5. Next Screen

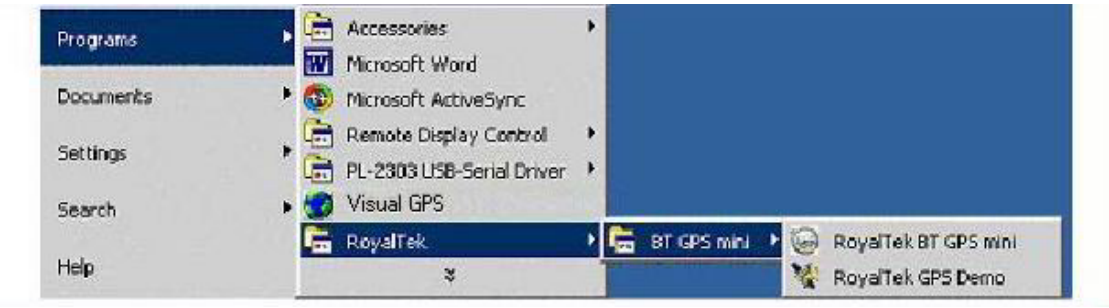
Clicking > to switch GPS bar chart image to have more GPS data.



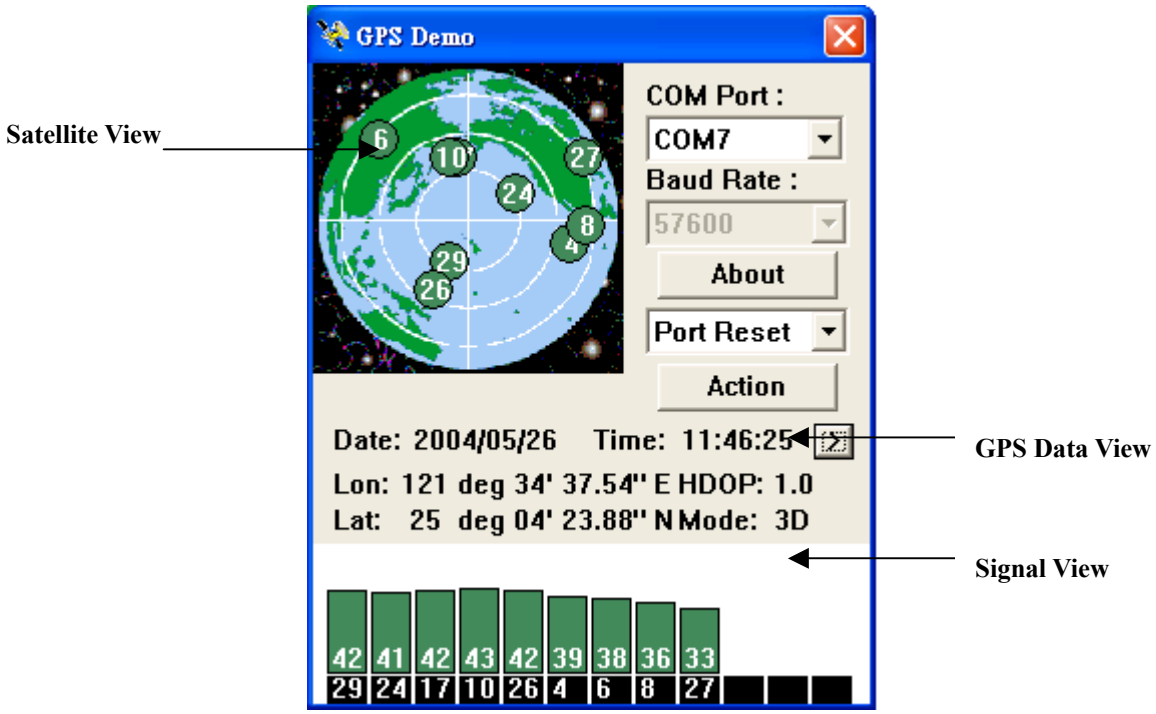
8. GPS Test on PC

8.1. Execute GPS Demo Program

ExecuteGPS Demo program by double clicking **GPS Demo** icon on **Programs** menu.



8.2. GPS Demo Screen



8.2.1. GPS Port:

GPS port searching automatically by GPS port first or using COM1 as the default com port.

8.2.2. Baud Rate:

Sole baud rate : 57600.

8.2.3. About:

Version displays..

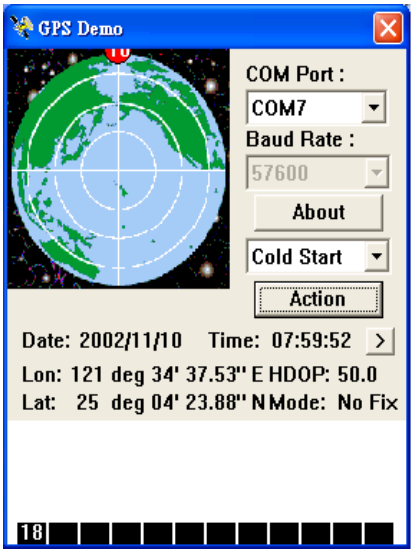
8.2.4. Action:

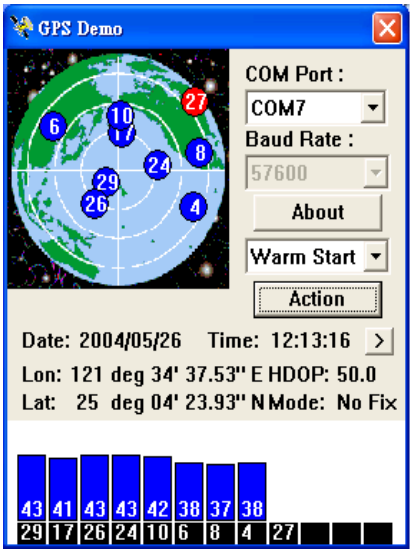
GPS action selection.

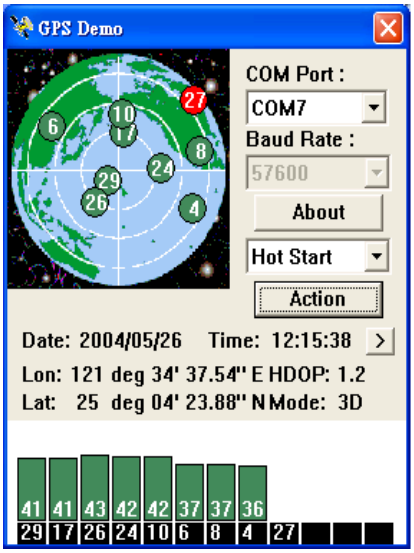
8.2.5. [>]

Switch to next screen shot.

8.3. Cold/Warm/Hot Start



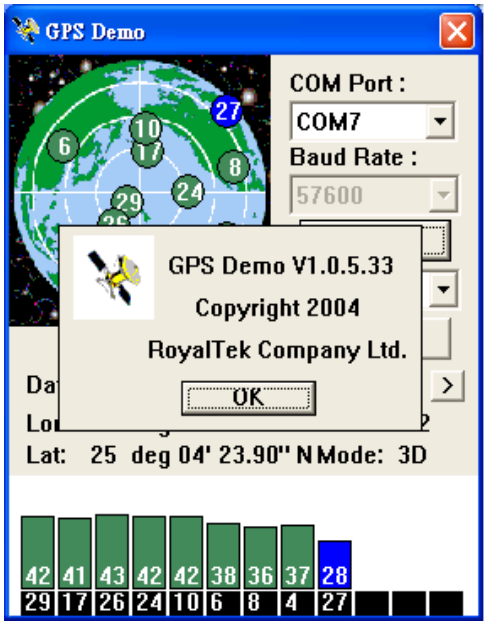

GPS Demo
COM Port :
COM7
Baud Rate :
57600
About
Warm Start
Action
Date: 2004/05/26 Time: 12:13:16
Lon: 121 deg 34' 37.53" E HDOP: 50.0
Lat: 25 deg 04' 23.93" N Mode: No Fix
43 41 43 43 42 38 37 38
29 17 26 24 10 6 8 4 27



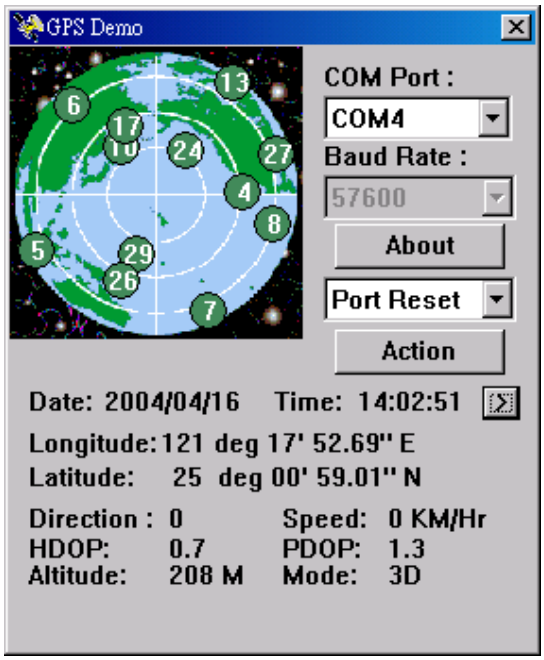
Selecting Cold/Warm/Hot Start in function scroll bar, then click **Action** to initialize Cold/Warm/Hot Start function.

8.4. About

This page shows the software version and the copyright claim.



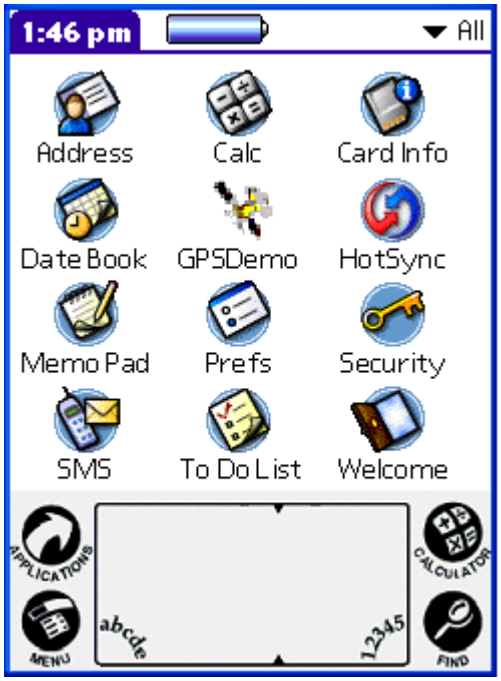
8.5. Next Screen



Clicking [>] to switch GPS bar chart image to have more GPS Data.

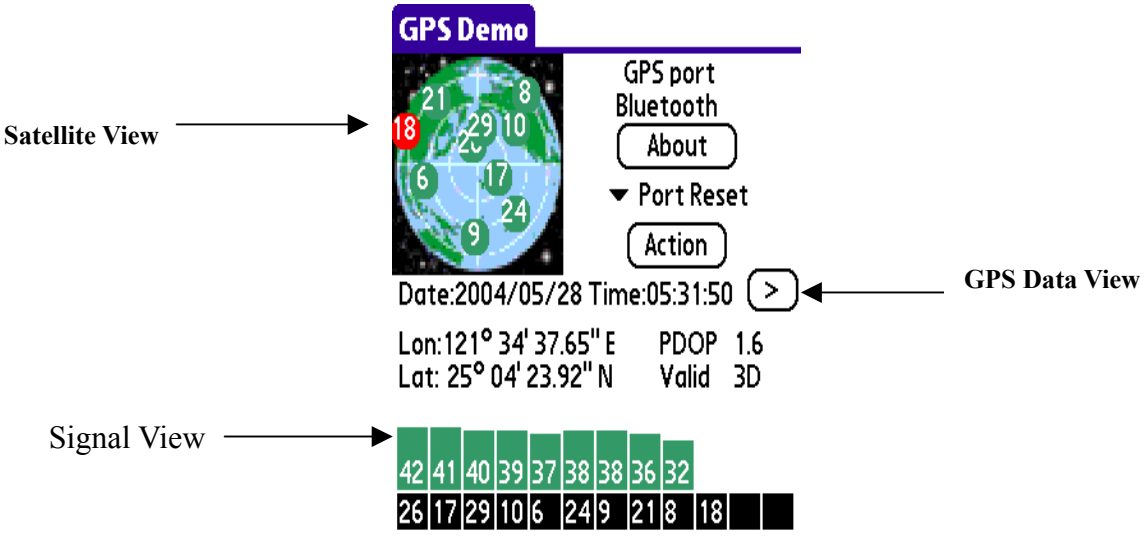
9. GPS Test on PDA of Palm OS

9.1. Execute GPS Demo Program



Execute RoyalTek GPS Demo program by double clicking **RoyalTek GPS Demo** icon on **Programs** menu.

9.2. GPS Demo Screen



9.2.1. GPS Port:

GPS port searching automatically by GPS port first or using COM1 as the default com port.

9.2.2. Baud Rate:

Sole baud rate : 57600.

9.2.3. About:

Version displays..

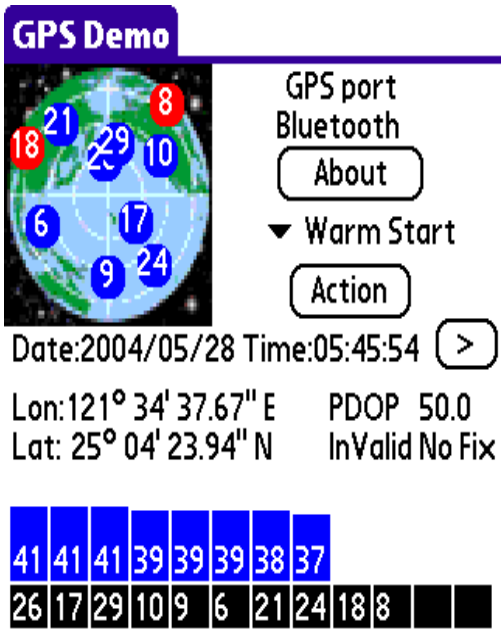
9.2.4. Action:

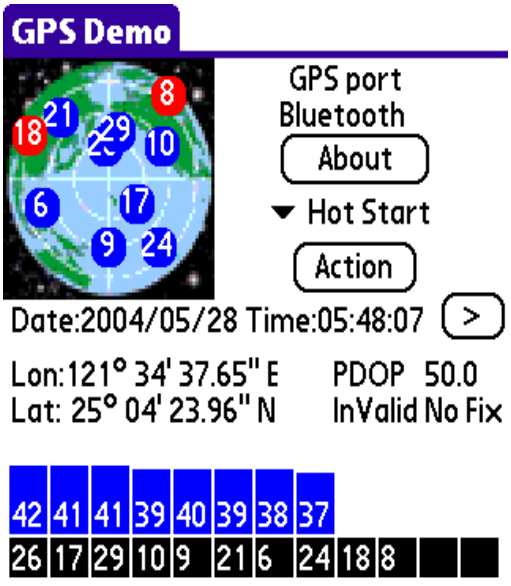
GPS action selection.

9.2.5. [>]

Switch to next screen shot.

9.3. Cold/Warm/Hot Start





Selecting Cold/Warm/Hot Start in function scroll bar, then click **Action** to initialize

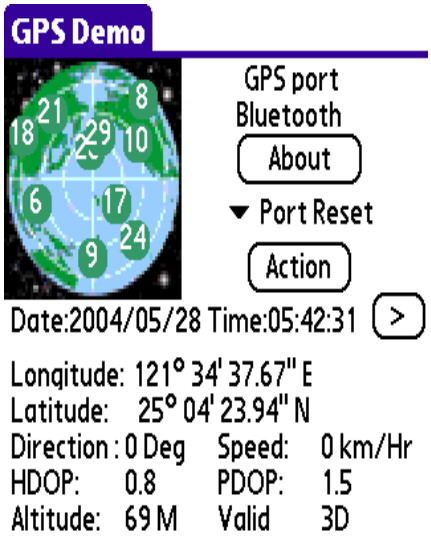
Cold/Warm/Hot Start function.

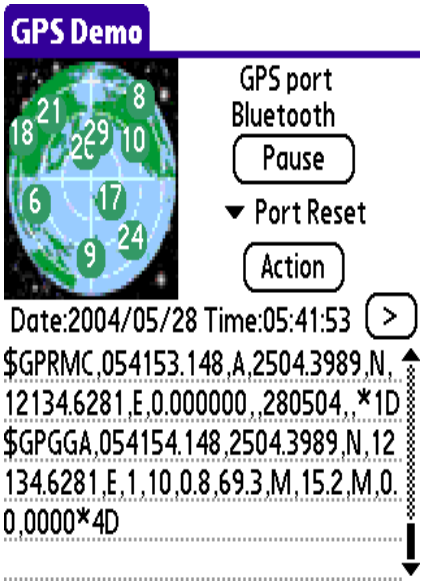
9.4. About

This page shows the software version and the copyright claim.

9.5. Next Screen

Clicking [>] to switch GPS bar chart image to have more GPS data.





10. Explanation of GPS Terminology

Degraded Mode:

It is the operation mode that uses 2 SVs or 1 SV for positioning output. The effect of degraded mode in GPS receiver is to have more position fix than none of it. It would sometimes have the situation of position drifting when this mode is enabled.

Elevation Mask:

GPS satellites that are low on the horizon are subject to noise due to the amount of atmosphere that the signal must travel through. Better position accuracy is often achieved if lower elevation satellites are not used in the position solution. The elevation mask is used to exclude the use of satellites in the position solution that are below a defined elevation mask.

DOP Mask:

DOP is the abbreviation of "dilution of precision". To achieve a positioning accuracy of 10m, it must combine the ranging accuracy and geometry to be acceptable values. GDOP is geometric dilution of precision which contains the effect of position (x, y, z) and time. PDOP is the position dilution of precision which contains the effect of position (x, y, z). HDOP is the horizontal dilution of precision which contains the effect of horizontal plane (x, y). Better position accuracy is often achieved with smaller DOP value. The DOP Mask is used to exclude the output of position that DOP value is higher than the DOP Mask.

SBAS Mode:

SBAS is abbreviation of Satellite-Based Augmentation Systems. It is WAAS in US, European Geostationary Navigation Overlay Service (EGNOS) in Europe and Multi-functional Transport Satellite (MTSAT) Satellite -based Augmentation System (MSAS) in Japan. It provides additional ranging capability, integrity information, and differential corrections at L1 frequency, which is broadcast from geostationary satellites.

Note:

RoyalTek provides two types of firmware. One is enhanced sensitivity and the other is Xtrac. Please refer to the following items as the difference between them when using Software Application.

1. **If the Device's firmware is Xtrac, the function of SBAS is unavailable.**
2. **If the Device's firmware is Xtrac, the function of Power Mode is unavailable.**

REMARK:

What is Xtrac? XTrac is a high sensitivity GPS software solution provided by SiRF company. SiRFXTrac extends the operating range in which GPS can be used - dramatically increasing the versatility of GPS-enabled products such as personal digital assistants (PDA's), automotive navigation solutions, AVL applications, and other location aware consumer devices. If loaded with SiRFXTrac high sensitivity software, GPS-enabled mobile consumer devices will be able to continue operating in far more locations than ever before possible.

Revision History

Data	Revision	Note
4/7/2004	V.1.0	
5/26/2004	V.1.5	

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